

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 10-05-2007		2. REPORT TYPE FINAL		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE The Operational Artist and the Air Power Palette				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Lance J. Luksik Paper Advisor (if Any):				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Joint Military Operations Department Naval War College 686 Cushing Road Newport, RI 02841-1207				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution Statement A: Approved for public release; Distribution is unlimited.					
13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.					
14. ABSTRACT Air power theorists and operational commanders have struggled to realize the irresistible promise of quick, decisive victories through employment of air power since the invention of the airplane. Historically, U.S. operational commanders have misunderstood and misapplied the lessons of their predecessors regarding the employment of air power to achieve operational objectives. A historical analysis of past successes and failures reveals that an integrated combined arms approach to warfare, under the unifying guidance of the operational commander, is the surest road to success in modern combat. Airpower alone will rarely achieve operational objectives, but with a balanced approach to the employment of air power in close synchronization with ground forces, commanders will achieve their objectives in the most efficient manner possible. This paper contains a brief history of air power theory, a historical analysis of selected air operations, and concludes with recommended guidelines that operational planners and commanders should observe to best employ air power in pursuit of operational objectives.					
15. SUBJECT TERMS Air Power, Operational Art					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 24	19a. NAME OF RESPONSIBLE PERSON Chairman, JMO Dept
a. REPORT UNCLASSIFIED	b. ABSTRACT UNCLASSIFIED	c. THIS PAGE UNCLASSIFIED			19b. TELEPHONE NUMBER (include area code) 401-841-3556



**NAVAL WAR COLLEGE
Newport, R.I.**

The Operational Artist and the Air Power Palette

By

Lance Luksik
LCDR USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

10 May 2007



NAVAL WAR COLLEGE
Newport, R.I.

The Operational Artist and the Air Power Palette

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

10 May 2007

Abstract

Air power theorists and operational commanders have struggled to realize the irresistible promise of quick, decisive victories through employment of air power since the invention of the airplane. Historically, U.S. operational commanders have misunderstood and misapplied the lessons of their predecessors regarding the employment of air power to achieve operational objectives. A historical analysis of past successes and failures reveals that an integrated combined arms approach to warfare, under the unifying guidance of the operational commander, is the surest road to success in modern combat. Airpower alone will rarely achieve operational objectives, but with a balanced approach to the employment of air power in close synchronization with ground forces, commanders will achieve their objectives in the most efficient manner possible. This paper contains a brief history of air power theory, a historical analysis of selected air operations, and concludes with recommended guidelines that operational planners and commanders should observe to best employ air power in pursuit of operational objectives.

Table of Contents

Introduction	1
History of Air Power Theory	2
Analysis of Past Air Operations	4
Successful Air Operations	5
Failed Air Operations	9
Recommendations	14
Conclusion	17
Endnotes	18
Bibliography	20

Introduction

The debate over how to best employ combat air power to win wars is as old as the airplane itself. For nearly a century, air power theorists and operational commanders have struggled to realize the irresistible promise of quick, decisive victories through employment of this wonder of modern warfare. Appearing to offer victory with minimal loss of blood and treasure, air power quickly ascended and took its place alongside ground and sea power, and is now integral to the American way of war. An icon of American military might, air power played a prominent role in every major armed conflict the United States has engaged in since World War I. Despite this history, rich with both success and failure, U.S. operational commanders continue to misunderstand and misapply the lessons of their predecessors.

While few would debate the sheer destructive firepower of modern combat aircraft, the question of what to destroy in order to achieve operational objectives looms large. Air power advocates, past and present, have proposed numerous doctrines addressing this question, all believing they had found the ‘holy grail’ of air power: the one true doctrine which, if followed precisely, would win wars decisively without the wanton destruction of ground battles. Unfortunately, this doctrine has proven elusive despite the ever-dizzying advance of technology, the rise of smart weapons, and the creation of aircraft such as the F-22 Raptor, arguably the most complex weapons system in history.

U.S. operational commanders, facing an increasingly casualty-averse public with little patience for protracted wars, continually turn to air power as a panacea offering easy victory. All too often, however, independent air operations prove futile, wasting both the

time and force dedicated to them. Despite the decades spent in search of air power's 'holy grail', history offers this simple truth: it does not exist. Instead, a far less glamorous alternative emerges: an integrated combined arms approach to warfare, under the unifying guidance of the operational commander, is the surest road to success in modern combat. Airpower alone will rarely achieve operational objectives, but with a balanced approach to the employment of air power in close synchronization with ground forces, commanders will achieve their objectives in the most efficient manner possible.

What follows is a brief history of the theory of air power, a historical analysis of the successes and failures of past air operations, and finally, basic guidelines for the operational planner to consider when developing air operations to achieve theater strategic and operational objectives. Constraints of space will necessarily limit the scope of this paper to the operational employment of fixed-wing combat aviation, omitting discussion of many important facets of air power: strategic air lift, aerial surveillance and reconnaissance, helicopter operations, airborne command and control, unmanned aerial systems, etc.

History of Air Power Theory

The first articulate air power theorist, and the first to espouse a belief in an independent war-winning capability inherent to air power, was the Italian artillery officer Giulio Douhet. His most famous book, *Command of the Air*, stated that warfare was inevitable and would be "total in character and scope."¹ Douhet argued that the rise of air power heralded the end of conventional ground battle. After the horrific loss of a generation of young men in the trenches of World War I, he believed that aircraft, using the third dimension to bypass the front lines and directly target enemy vital centers,

would ultimately save lives. He wrote that self-defending bombers dropping incendiary and poison gas bombs directly on enemy population centers would create such a panic among the citizens that they would rise up against their own government and demand an end to the war. He further speculated that this would occur before long and bloody ground battles developed, ending the conflict quickly.²

During the interwar years in America, aviation pioneers developed similar theories arguing that airpower would independently win wars. William ‘Billy’ Mitchell, the senior U.S. air commander in World War I, and instructors at the Air Corps Tactical School, where nearly all American air commanders in World War II were trained, championed a strategic bombing doctrine that targeted the enemy’s industrial infrastructure. This idea was based on an “industrial web” theory that preached all major structural components were interconnected, and that destroying key nodes would paralyze the whole system.³ Mitchell explained:

“Air power can attack the vital centers of the opposing country directly, completely destroying and paralyzing them.” “Not only can a decisive stroke be made against a great industrial and commercial country by aircraft, but it can be held in subjugation much more easily by an air force than by an army or navy.”⁴

In Britain, the “father of the RAF,” Hugh Trenchard, employed a strategy that appeared similar in execution, but was actually of a different nature. Instead of targeting the enemy’s capability to fight, his doctrine targeted the enemy’s morale, or will to fight:

“He believed that destroying the enemy’s industry, communications, transportation network, and economy would so disrupt the daily life of the working population, causing unemployment and hardship, that the people would demand an end to the war.”⁵

Air commanders after World War II, instead of understanding the inherent strength in joint land, sea, and air operations, convinced themselves that strategic

bombing won the war. The hard lessons of Korea were likewise brushed aside, leading America into the dismal failure of Operation Rolling Thunder in Vietnam, a strategic air operation based on Thomas Schelling's theory of gradual escalation to coerce the enemy to cease hostilities.⁶ While air power advocates struggled to understand these failures, they did not question the ability of air power to independently achieve operational objectives. They did not believe the theory was wrong; instead, they believed the target set was wrong.

More recently, Col. John Warden's Gulf War air operation, named Instant Thunder in an attempt to reverse the errors of the past, was actually another strategic air operation based on his own "5 rings" model. This model shifted the targeting emphasis from the enemy economy to the enemy leadership. Warden wrote, "The essence of war is applying pressure against the enemy's innermost strategic ring – its command structure."⁷ Instant Thunder, in its original form, had no provisions for interdiction or close air support,⁸ because he believed that "strategic warfare provides the most positive resolution of conflicts."⁹ Thankfully, his senior commanders disagreed, and insisted on including both interdiction and close air support, producing a highly effective operation.¹⁰

Analysis of Past Air Operations

The history of air power is rife with examples of both stunning success and humiliating failure. Often, elements of both are found within the same conflict, as America's efforts in Korea and Vietnam prove. While the following cases in no way encompass every lesson to be gleaned from history, they do serve to illustrate the primary operational capabilities and limitations of fixed-wing combat aviation in the modern battle space.

Successful Air Operations

Air superiority is the key to unlocking all of the benefits of air power. General Erwin Rommel wrote, “Anyone who has to fight, even with the most modern weapons, against an enemy in complete control of the air fights like a savage against modern European troops, under the same handicap, and with the same chance of success.”¹¹ Air superiority sets the stage for successful ground operations; without it, infantrymen are at grave risk. America’s experience in the Korean War demonstrates this clearly. When the U.S. faced the North Korean Air Force in the summer of 1950, they did so with outdated F-51 Mustangs and F-80 Shooting Stars, which proved adequate for the job. U.S. Air Force (USAF) pilots swept the North Koreans from the skies within weeks, enabling MacArthur to push all the way to the Chinese border.¹² When the Chinese entered the conflict, however, the situation changed dramatically. Flying the latest offering from the Mikoyan-Gurevich design bureau, the MiG-15 Fagot, Chinese and covert Russian pilots contested the skies over “MiG Alley,” an area over the Yalu River separating North Korea from China. Due to restrictions imposed by the U.S. government to prevent escalation, Chinese pilots enjoyed a sanctuary North of the Yalu, and were free to operate unimpeded from their bases. For approximately three months, the U.S. Air Force lost air superiority over this critical geographic region.¹³ Unable to conduct aerial observation, the U.S. completely underestimated the size of the Chinese invasion force. The USAF responded quickly by deploying their latest fighter, the F-86 Sabre, to the region and regained air superiority. The subsequent U.S. bombing operation, the primary instrument the U.S. used to coerce the North Koreans to sign the armistice, was rarely threatened by Chinese air power.¹⁴

This example illustrates both the operational freedom air superiority allows and the risk commanders face when deprived of it. When faced with an adversary possessing a capable air force, planners must make air superiority a top priority early in the conflict, and must continually dedicate the assets required to maintain it. Without air superiority, the most likely result is mission failure.

In perhaps the most spectacular example of gaining air superiority through operational fires, the Israeli Air Force (IAF) fired the opening rounds in the Arab-Israeli War of 1967, also known as the Six Day War. When Egyptian forces began massing on the Sinai Peninsula after months of saber-rattling war rhetoric, the IAF was at a severe disadvantage compared with the Egyptian Air Force (EAF). The IAF had only 196 combat aircraft operating from 4 airfields, while the EAF had over 500 combat aircraft operating from 23 airfields.¹⁵ Fully understanding the absolute requirement for air superiority during subsequent ground operations in open desert terrain, the Israeli commanders devised a bold plan to negate the Egyptian advantage. Named Operation Moked, the plan called for the eradication of the EAF on the ground prior to any ground hostilities.¹⁶ Practicing outstanding operational security, the Israeli pilots struck their blow on the morning of 5 June 1967 in complete surprise. The Egyptian dawn patrol aircraft had recently landed and were unprepared to mount a defense. After 3 hours of attacks, 85% of Egyptian combat air power was destroyed. By the end of the first day of the war, 410 Arab aircraft were destroyed, 390 of them on the ground. Six days later, the final totals were 444 Arab aircraft destroyed, with only 40 Israeli aircraft destroyed.¹⁷ Egyptian troops in the Sinai were left virtually without air cover for the remainder of the war, giving Israeli ground troops a decisive advantage.¹⁸ Operating under the protective

cover of the IAF, Israeli infantry and armor were able to quickly defeat the Egyptian forces.

If civilian leaders have the political will to allow pre-emptive strikes of this nature, it is by far the most efficient means to gain the air superiority so critical to modern conventional warfare. Whether conducted by aircraft or cruise missiles, destroying an enemy air force on the ground will produce a tremendous advantage with an economy of force.

Possibly the greatest benefit air operations can provide to ground commanders is preparation of the battlefield. An unusually successful example of this occurred in the first Gulf War of 1991. Prior to the ground offensive in the Kuwait Theater of Operations, coalition aircraft conducted nineteen continuous nights of ‘tank plinking,’ the informal name for targeting individual tanks with precision-guided munitions.¹⁹ The physical effects of this bombing were significant, as were the psychological effects:

“The effect of random tanks blowing up sporadically throughout the night drove those tank crews to seek shelter a safe distance away from their weapons. The amount of equipment the fleeing Iraqis left behind was staggering, but the truly amazing fact is just how much of that equipment had been abandoned well before it was ever directly threatened by coalition fire.”²⁰

B-52 strikes were another effective method of battlefield preparation. A number of Iraqi soldiers feared these strikes more than anything else due to their noise, intensity, and duration. Survivors of B-52 strikes likened it to “being caught in the Apocalypse” and explained “one lost control of bodily functions as the mind screamed incomprehensible orders to get out.”²¹ One troop commander identified these strikes as the sole reason he surrendered his troops.²² By the time coalition troops advanced on the battlefield, many Iraqi soldiers had lost all hope and were relieved to finally see someone to whom they

could surrender. In one case, an Iraqi battalion of over four hundred infantrymen at Thaqb al Hajj surrendered to one U.S. company after four hours of air attack conducted by Apaches and A-10s.²³

It is true that capitulation on this scale is rare, and even unlikely to recur, but the effects of battlefield preparation must not be underestimated. These operations will have a direct impact on the speed and success of ground operations, even when facing an ideologically motivated enemy. If time constraints will not allow for lengthy preparation, planners must not abandon the effort. Even hours of preparation will provide friendly ground forces with an advantage.

U.S. employment of air power in Vietnam was plagued with failure, but there were also successful operations deserving analysis. Operations Linebacker I and Linebacker II were dedicated interdiction operations. Different from strategic bombing, interdiction is aimed solely at limiting the enemy's capability to wage war by destroying war supplies before they reach the front lines. North Vietnam's Easter Offensive of 1972 was a change from previous communist efforts in Vietnam, which were largely guerilla in nature. Instead, the Easter Offensive was a massive conventional attack using tanks and artillery. It was initially highly successful: the North Vietnamese Army overran every firebase in the Demilitarized Zone, decimated three Army of the Republic of Vietnam divisions, controlled numerous provincial capitals, and threatened An Loc, a provincial capital sixty miles north of Saigon. President Nixon authorized Linebacker I in an attempt to coerce the North to halt the offensive and accept a cease-fire agreement.²⁴ A pure interdiction operation, it was aimed primarily at logistical centers and transportation arteries. A month later, the Easter Offensive had stalled, the communists were on the

defensive, and they no longer controlled any of the forty-four provincial capitals.²⁵ On 22 October 1972, the North signed a cease-fire agreement. However, the North backed away when the South refused to sign. Linebacker II started on 18 December 1972 in order to bring the North back to the peace table. Linebacker II was a shorter, more intense version of Linebacker I, and succeeded in preventing the North from rebuilding its logistic network, making any further conventional offensive impossible. As a result, the North finally signed the Paris Accords.²⁶

An interdiction operation can be an extremely effective means to achieve operational objectives. However, its efficacy is largely governed by the nature of the enemy. If the enemy requires little sustainment, or can forage locally to meet his needs, interdiction will prove futile. This was the case in Vietnam prior to the Easter Offensive, and applies to many insurgencies. However, conventional forces are voracious supply consumers, making them wholly vulnerable to interdiction. When the North changed from guerrilla operations to conventional operations, it became vulnerable to American air power, which had previously seemed impotent. When planners understand this concept, they will be able to tailor air operations to enemy weaknesses, instead of expecting bombing operations to work in every conflict.

Failed Air Operations

As previously noted, the air power theorists of World War II strongly believed in strategic bombing. In March 1945, USAF bombers under the command of General Curtiss LeMay began one of the most destructive strategic bombing campaigns in history against Japan. Though not overtly stated, the operation was an attempt to break the will of Japan's leadership by targeting civilians. LeMay directed his B-29s to fly at low

altitudes over Japanese cities at night to deliver massive payloads of incendiary bombs. On 9 March 1945, USAF bombers conducted the most devastating single air attack in history, eclipsing even the atomic attacks that followed. Eighty-four thousand civilians were killed and sixteen square miles of city were burned to ashes. By the end of the war, Japanese civilian casualties were staggering: Japan's six largest cities were decimated, and fifty-eight of sixty-two cities with populations over 100,000 were burned. 900,000 people perished, and twenty-two million were rendered homeless.²⁷

The argument that these fire raids and the atomic bombs ended World War II is, at best, difficult to prove. The more compelling argument is that the Emperor finally surrendered not because of civilian casualties, but due to the threat of invasion. In his speech to his cabinet on the night of 9 August 1945, he articulated that he viewed defense of the Japanese homeland to be hopeless, and that national survival dictated surrender.²⁸ Thus, American efforts to break the will of the Japanese people by targeting civilians did not bring the war to an end. Despite those who continue to believe otherwise, targeting the will of the people with strategic air power simply does not work and is a tremendous waste of human life.

In World War II's European theater, the German Army's advance to the Dnieper River in 1941 was marked by successful combined arms operations: German fighters provided cover for bombers conducting interdiction and close air support operations. When the Russian Army began its counteroffensive, however, German officers began neglecting air superiority and interdiction sorties in favor of close air support. Incredibly, they began to employ large, twin-engine high altitude bombers in low-level close air support missions. The large, slow aircraft were wholly unsuited to the mission, and

sustained heavy losses. Even reconnaissance aircraft were eventually employed in the close air support mission. Air superiority was lost, interdiction and reconnaissance operations ceased, and the Luftwaffe became subordinate to ground commanders.²⁹

The complete breakdown of German military leadership was surely to blame for such a gross misallocation of air assets. While air power can multiply the effectiveness of ground campaigns, it cannot salve the wounds created by a complete lack of operational design on the part of ground commanders. Had air superiority, interdiction, and reconnaissance remained a priority, the German army would have survived far longer. It must be stated, however, that given the complete dysfunction within the German military machine at that time, the outcome would likely have been the same.

Korea was the first war fought by the newly independent USAF. After the front lines had stabilized in June of 1951, the USAF tried to develop a strategic bombing operation that would alone compel the North Koreans to sign an armistice ending hostilities.³⁰

“Air power constitutes the most potent means, at present available to the UN Command, of maintaining the degree of military pressure which might impel the Communists to agree, finally, to acceptable armistice terms.”³¹

- Chairman of the Joint Chiefs of Staff, Gen Omar Bradley

When political restrictions on bombing China prevented the strategic bombing they so desired, planners turned to an interdiction plan called Operation Strangle. The results of Operation Strangle were dismal, and failed to compel the North Koreans to sign the armistice.³² Struggling to justify their independence, the Air Force embarked on a new operation dubbed Air Pressure, designed not to delay the transport of supplies, but to eliminate the supplies themselves. This new plan included previously untargeted hydroelectric plants on the Yalu River. By October 1952, the hydroelectric plants were

down and North Korea suffered major blackouts. Firebombing raids reminiscent of World War II destroyed most North Korean cities, yet the North Koreans would not relent at the peace tables.³³ Growing desperate to force a change, the Air Force then embarked upon the highly controversial plan of targeting the North Korean rice crop. The Air Force struck five dams in May 1953, flooding massive amounts of crops. The next month, the North Koreans finally signed the armistice still in effect today.³⁴

The bombing operations conducted in Korea did not produce the intended effects in the time predicted by senior Air Force officials. Although these efforts may arguably have prevented a Chinese attack further into U.S. lines, they failed to win the peace for almost two years after the lines had stabilized. U.S. planners had totally overestimated the effects air operations would have because they did not truly appreciate the nature of their adversaries. U.S. divisions required over six hundred tons of supply per day to maintain combat effectiveness. The Chinese divisions, in stark contrast, required only fifty tons of supplies per day.³⁵ So while the U.S. was stopping and destroying a great deal of materiel headed for the front, very little was required to make it through to keep the Chinese provisioned. While air power certainly was a major contributing factor, the long frustrating years required to produce the armistice demonstrate just how limited air power is when employed in pursuit of operational and strategic objectives without an accompanying ground offensive.

Operation Rolling Thunder in Vietnam remains one of the most contentious air operations ever conducted. President Johnson's objective was an "independent, stable, non-communist South Vietnam."³⁶ The nature of the operation evolved through at least four stages ranging from true strategic bombing to interdiction. Conceived by

commanders who felt the unrestricted strategic bombing campaigns of World War II were the ideal, the operation was cast in their mold. Air chiefs targeted vital economic and military centers in the belief that destroying the North's war-making capabilities would also affect the populace, weakening their will to fight.³⁷ This operation proved frustratingly ineffective to civilian and military officials alike, who constantly sought the one magic target set that would force the North to capitulate. President Johnson also tried to use the air operation to send coercive messages to Hanoi: easing air operations when peace talks were promising, intensifying them when peace talks stalled. Rolling Thunder continued for years under changing objectives and target sets, never yielding the intended results.

Completely controlled by the heavy hand of Washington, military commanders felt overly restrained, while civilian leaders felt it was a poorly conceived plan to accomplish their objectives. They were both right. Never have strategic, operational, and tactical lines been so blurred as they were in the 'Tuesday lunch group' targeting meetings where the President himself chose not only the targets, but often the tactics to be used as well.³⁸ The larger problem, however, was a complete misunderstanding of the nature of the war. Vietnam was a largely agrarian state whose industrial capabilities and economy had little to do with either its ability to wage war or the people's will to fight it.³⁹ No strategic bombing operation would have produced the desired results when faced with an ideologically motivated peasant army conducting guerilla operations under the cover of a triple-canopy jungle. The operation was completely divorced from its vague strategic objectives and was developed for a different enemy in different circumstances.

Recommendations

The preceding examples illustrate the incredible complexity of employing air power to produce operational results. Commanders often misunderstand air power, believing that it is far more capable than it is, or misapply air power in the hope that it will make up for shortfalls in operational design. There is no single recipe that will guarantee success in every conflict. There are, however, general guidelines and principles governing the application of air power that will ensure air forces are used to achieve operational objectives in the most efficient manner possible while avoiding the mistakes of the past.

First, if politically feasible, air operations against an adversary with a credible air force should begin with a preemptive strike against all enemy offensive air power while it is still on the ground. Dependent on enemy air defense capabilities, this should be carried out by cruise missiles and air attacks, and should also target all located surface-to-air missile systems (SAMS). The goal of this strike is to gain immediate air superiority for subsequent air operations. If accompanied by a ground assault, coordination between air and ground forces is critical to prevent fratricide.

If a preemptive strike of this nature is not politically or militarily feasible, then air operations should begin with intense offensive counter-air operations accompanied by attacks on SAMS with the same goal: air superiority. This will likely take much longer to accomplish than a preemptive strike, but is, nonetheless, a prerequisite for an effective bombing campaign.

Second, once air superiority is achieved, effective bombing operations should commence. Commanders must decide what targets to hit to achieve operational and

strategic objectives. This is by far the most difficult decision commanders will make in guiding air operations. There should be three main components of the bombing operation: preparation of the battlefield, interdiction, and, if applicable, strategic bombing.

Preparation of the battlefield will smooth the way for ground forces by directly targeting enemy machines of war such as tanks, armored vehicles, trucks, and heavy artillery that lie in the friendly line of advance. Done well, this effort will produce major dividends for ground forces as they advance to their objectives.

The interdiction plan requires close pre-conflict analysis. An enemy may or may not be vulnerable to interdiction. A peasant army operating in a jungle environment and foraging off the land may be immune to interdiction, while a conventional force in open desert terrain will be terribly vulnerable. If the enemy is deemed vulnerable, interdiction should take place on two levels. 'Strategic interdiction' sorties should target war material production facilities and major war material importation facilities. The goal is to stop war supplies from entering the transportation system. 'Operational interdiction' sorties should target transportation and storage facilities to halt the flow of supplies to enemy combat forces.

An especially demanding question is whether to conduct strategic bombing. Simply possessing the ability to wage a strategic bombing operation does not mean that is the most appropriate use of assets. One must first assess the nature of the conflict and the vulnerabilities of the enemy. An ideologically motivated adversary fighting an unlimited (from the enemy point of view) guerilla conflict is unlikely to be deterred by strategic bombing. Conversely, a highly industrialized nation whose war-making capability is

largely tied to the economy, like our own, will be vulnerable to a strategic bombing operation. As Clausewitz stated:

"The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature."⁴⁰

Commanders must remember that 'targeting the will of the people' is extremely unlikely to produce the desired results and will probably de-legitimize the entire effort. Far more lucrative targets may be the leader of a regime, specific members of the elite, or key economic centers, depending on the strategic center of gravity. Collateral damage must also be addressed, and will often outweigh any expected benefits of a strategic bombing operation.

Finally, as ground forces begin advancing, air commanders must allocate forces to close air support. Regardless of how effective the battlefield preparation was, it must be assumed that enemy forces are still capable of conducting effective combat operations. Having on-call close air support will give ground forces a tremendous advantage over enemy troops deprived of air cover, both physically and psychologically.

Commanders need to remember that the allocation and apportionment of air assets must be balanced. While the percentage of air power dedicated to each mission area will vary widely through the course of the conflict, neglect of any one mission area may be detrimental to the entire effort. This is one area where clear commander's guidance is crucial, with the objective as the determining factor.

An overarching principle that must be kept in mind is that air operations must be closely coordinated with ground forces to achieve maximum effects. Using either instrument alone is usually a waste blood, treasure, and time. Operational objectives are

almost always gained more quickly by a combined arms effort than by any one arm of the military alone. While air power proponents may argue that Korea or Kosovo disproves this, it must be pointed out that the extreme length of time required in each operation when compared to the planners' estimates more clearly demonstrates air power's limitations than capabilities.

Conclusion

The debate over how to employ air power will see no end. With every significant advance in aerial weapons technology, such as precision-guided munitions, or new aircraft technology, such as stealth, an over-eager enthusiast will argue anew that airpower has finally reached its destiny and is capable of single-handedly deciding the fate of nations. Commanders and planners must view these claims through the calm, reasoning lens of operational art. They must discern the true benefits of such advances, but understand that the application of operational art in pursuit of objectives remains unchanged. Air power is an extremely powerful tool when employed intelligently, but it also has limitations. Decisive in a conventional war against a nation whose economy is dependent upon industry, it will be far less effective when facing a counterinsurgency in a peasant nation. Whatever the situation, only a commander wielding air and ground forces together in pursuit of common objectives will achieve victory in the most efficient manner possible.

Endnotes

-
- ¹ Guilio Douhet, The Command of the Air (Washington D.C.: Office of Air Force History, 1983), 6.
- ² Phillip S. Meilinger, "The Historiography of Airpower: Theory and Doctrine," Journal of Military History (April 2000), 472.
- ³ Ibid, 476.
- ⁴ Johnny R. Jones, William "Billy" Mitchell's Air Power (Maxwell Air Force Base, Alabama: Airpower Research Institute, College of Aerospace Doctrine, Research, and Education, 1997), 6.
- ⁵ Ibid, 481.
- ⁶ Thomas C. Schelling, Arms and Influence (New Haven: Yale University Press, 1966).
- ⁷ John A. Warden III, "The Enemy as a System," Airpower Journal (Spring 1995), 52.
- ⁸ Michael R. Gordon and Bernard E. Trainor, The General's War (Boston: Little, Brown and Company, 1995), 82.
- ⁹ Warden, "The Enemy as a System," 49.
- ¹⁰ Gordon and Trainor, The General's War, 84, 91-94.
- ¹¹ Jon Huss, "Exploiting the Psychological Effects of Airpower: A Guide for the Operational Commander," Aerospace Power Journal (Winter 1999), 26.
- ¹² Michael A. Kirtland, "Planning Air Operations: Lessons from Operation Strangle in the Korean War," Air Power Journal (Summer 1992), 43-46.
- ¹³ Conrad C. Crane, American Airpower Strategy in Korea, 1950-1953 (Kansas: University Press of Kansas, 2000), 48-50.
- ¹⁴ Callum A. MacDonald, Korea: The War Before Vietnam (New York: The Free Press, 1986), 237.
- ¹⁵ B.L. Blustone and J.P. Peak, Air Superiority and Airfield Attack (Washington D.C.: Defense Nuclear Agency, 15 May 1984), 137-139.
- ¹⁶ Ibid, 122-124.
- ¹⁷ Ibid, 137-139.
- ¹⁸ George W. Gawrych, "The Egyptian Military Defeat of 1967," Journal of Contemporary History (April 1991), 290.
- ¹⁹ Huss, "Exploiting the Psychological Effects of Airpower," 27.
- ²⁰ Ibid.
- ²¹ Ibid, 28.
- ²² Ibid.
- ²³ Ibid, 30.
- ²⁴ Robert A. Pape, Bombing to Win: Air Power and Coercion in War (Ithaca: Cornell University Press, 1996), 197.
- ²⁵ Ibid, 199.
- ²⁶ Ibid, 201-202.
- ²⁷ Ibid, 103-104.
- ²⁸ Ibid, 122-123.
- ²⁹ Andrew Brookes, Air War Over Russia (Surrey: Ian Allan Publishing, 2003), 150-151.
- ³⁰ Thomas E. Griffith, "Air Pressure: Strategy for the New World Order?" Air Power Journal (Summer 1994), 20.

-
- ³¹ William W. Momyer, Airpower in Three Wars (Maxwell Air Force Base, Alabama: Air University Press, 2003), 170-171.
- ³² Kirtland, "Operation Strangle," 43-46.
- ³³ Griffith, "Air Pressure," 20-23.
- ³⁴ Griffith, "Air Pressure," 23-26.
- ³⁵ MacDonald, Korea: The War Before Vietnam, 239.
- ³⁶ Mark Clodfelter, The Limits of Air Power (New York: The Free Press, 1989), 72.
- ³⁷ Ibid, 73.
- ³⁸ Ibid, 85-86.
- ³⁹ Ibid, 144.
- ⁴⁰ Carl von Clausewitz, On War (Princeton, N.J.: Princeton University Press, 1976), 88.

Bibliography

- Ash, Eric. "Terror Targeting: The Morale of the Story." *Aerospace Power Journal* 13, no. 4 (Winter 1999): 33-47.
- Bacevich, Andrew J. and Eliot Cohen, eds. *War Over Kosovo*. New York: Columbia University Press, 2002.
- Blustone, B.L. and J.P. Peak. *Air Superiority and Airfield Attack: Lessons From History*. Washington D.C.: Defense Nuclear Agency, 15 May 1984.
- Brookes, Andrew. *Air War Over Russia*. Surrey: Ian Allan Publishing, 2003.
- Clausewitz, Carl Von. *On War*. Ed. and trans. Michael Howard and Peter Paret. Princeton, N.J.: Princeton University Press, 1976.
- Clodfelter, Mark. *The Limits of Airpower: The American Bombing of North Vietnam*. New York: The Free Press, 1989.
- Crane, Conrad C. *American Airpower Strategy in Korea, 1950-1953*. Kansas: University Press of Kansas, 2000.
- Douhet, Giulio. *The Command of the Air*. Trans. Dino Ferrari. Washington D.C.: Office of Air Force History, 1983.
- Edmonds, David K. "In Search of High Ground: The Airpower Trinity and the Decisive Potential of Airpower." *Airpower Journal* 12, no. 1 (Spring 1998): 4-22.
- Futrell, Robert F. "Tactical Employment of Strategic Air Power in Korea." *Air Power Journal* 2, no. 4 (Winter 1988): 29-41.
- Gawrych, George W. "The Egyptian Military Defeat of 1967." *Journal of Contemporary History* 26, no. 2 (April 1991): 277-305.
- Gordon, Michael R. and General Bernard E. Trainor. *The General's War*. Boston: Little, Brown and Company, 1995.
- Griffith, Thomas E. "Air Pressure: Strategy for the New World Order?" *Air Power Journal* 8, no. 2 (Summer 1994): 18-26.
- Huss, Jon. "Exploiting the Psychological Effects of Airpower: A Guide for the Operational Commander." *Aerospace Power Journal* 13, no. 4 (Winter 1999): 23-32.
- Jones, Johnny R. *William "Billy" Mitchell's Air Power*. Maxwell Air Force Base, Alabama: Airpower Research Institute, College of Aerospace Doctrine, Research, and Education, 1997.
- Kirtland, Michael A. "Planning Air Operations: Lessons from Operation Strangle in the Korean War." *Air Power Journal* 6 no. 2 (Summer 1992): 37-46.
- Meilinger, Phillip S. "The Historiography of Airpower: Theory and Doctrine." *The Journal of Military History* 64, no. 2 (April 2000): 467-501.

-
- Momyer, William W. *Airpower in Three Wars*. Maxwell Air Force Base, Alabama: Air University Press, 2003.
- Pape, Robert A. *Bombing to Win: Air Power and Coercion in War*. Ithaca: Cornell University Press, 1996.
- Schelling, Thomas C. *Arms and Influence*. New Haven: Yale University Press, 1966.
- Warden III, John A. "The Enemy as a System." *Airpower Journal* 9, no. 1 (Spring 1995): 40-56.